Solar Hot Water

The shallow water of a lake is usually warmer than the deep water. That's because the sunlight can heat the lake bottom in the shallow areas, which in turn, heats the water. It's nature's way of solar water heating. The sun can be used in basically the same way to heat water used in buildings and swimming pools.

For solar hot water systems, flat-plate solar collectors are typically installed facing south on a rooftop.

Most solar water heating systems for buildings have two main parts: a solar collector and a storage tank. The most common collector is called a *flat-plate collector*. Mounted on the roof, it consists of a thin, flat, rectangular box with a transparent cover that faces the sun. Small tubes run through the box and carry the fluid — either water or other fluid, such as an antifreeze solution — to be heated. The tubes are attached to an absorber plate, which is painted black to absorb the heat. As heat builds up in the collector, it heats the fluid passing through the tubes.

The storage tank then holds the hot liquid. It can be just a modified water heater, but it is usually larger and very well-insulated. Systems that use fluids other than water usually heat the water by passing it through a coil of tubing in the tank, which is full of hot fluid.

Solar water heating systems can be either active or passive, but the most common are active systems. Active systems rely on pumps to move the liquid between the collector and the storage tank, while passive systems rely on gravity and the tendency for water to naturally circulate as it is heated.

Swimming pool systems are simpler. The pool's filter pump is used to pump the water through a solar collector, which is usually made of black plastic or rubber. And of course, the pool stores the hot water.